



Janet Napolitano  
Governor

# ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Stephen A. Owens  
Director

## Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Yuma Area on July 8, 2007

### Background

The Arizona Department of Environmental Quality (ADEQ) issues Dust Control Action Forecasts for the Yuma and Phoenix areas as part of the Natural Events Action Plan for these areas. On Friday July 6, 2007, ADEQ air quality forecasters issued the Yuma and Vicinity Dust Control Action Forecast which called for a moderate risk of wind-blown dust for Sunday July 8<sup>th</sup>. This was due to the possibility for gusty winds caused by outflows from nearby and even distant thunderstorms. The potential high wind / wind-blown dust event equated to a moderate risk of exceeding the PM<sub>10</sub> National Ambient Air Quality Standards (NAAQS) in the Yuma area. The Dust Control Action Forecast is included in the bottom right corner of Figure 1 and can also be found as an attachment. The forecasts/advisories satisfy the requirement in 40 CFR 51.920(a)(1).

As can be seen in the GOES Satellite images located center-right in Figure 1, a large thunderstorm cluster developed over southeastern Arizona near the Mexico border late in the evening of July 7<sup>th</sup> and into the early morning of July 8<sup>th</sup>. This storm created very strong outflow with winds capable of transporting loose soils and dust significant distances. Transport of airborne dust from the southeast towards Yuma is evident in the radar images also located in the center right of Figure 1. Strong, gusty winds were observed in the Yuma area beginning in the 12:00 a.m. hour of July 8, 2007. The initialization of the wind-blown dust event is evident in the NWS and AzMET monitors. Both the NWS monitor and AzMET monitor in Yuma recorded strong south to southeasterly winds with

gusts approaching 40mph during the 2:00-3:00 a.m. hours. In addition, the NWS Yuma monitor reported reduced visibility lasting from 2:00 a.m. through 8:00 a.m. with minimum visibility of 2 miles occurring during the 3:00 a.m. hour (see attachments). It appears that gusty south-southeasterly winds, generated as outflow from a large thunderstorm complex in northern Mexico, were strong enough to pick up and suspend loose soil, transport it as airborne dust, and deposit this particulate matter in the Yuma area. The dust then remained in the air, as light winds followed after the passing of the outflow. This allowed for particulate matter to remain suspended in the air throughout the morning hours of July 8<sup>th</sup>, until southerly winds increased during the late morning and afternoon hours, clearing the dust and haze from the air over Yuma. All appropriate standard implementation plan (SIP) control measures were in place during the event demonstrating, per 40 CFR 50.1(j), that the event “is not reasonably controllable or preventable.”

A significant thunderstorm complex in southeastern Arizona and Northern Mexico brought a high-wind event with elevated ambient concentrations of PM<sub>10</sub> to the Yuma area that exceeded the NAAQS at the Yuma Courthouse monitor operated by ADEQ. The fact that ambient concentrations exceed the NAAQS satisfies the criteria in 40 CFR 50.1(j) that the event “affects air quality.”

The following are the key PM<sub>10</sub> monitor readings for the monitors examined in this report:

Monitor (Operator/Type)	AQS ID	24-hr Avg PM <sub>10</sub>	1-hr Max PM <sub>10</sub>	Time of Max 1-hr	Flag**
<b>YUMA AREA</b>					
<b>Yuma Courthouse (ADEQ/BAM)</b>	<b>04-027-0004*</b>	<b>185</b>	<b>723</b>	<b>0200</b>	<b>A or RJ</b>

\* EPA Air Quality System Identification Number

\*\* 24-hr PM<sub>10</sub> concentration influenced by natural or exceptional event to be flagged.

Type Abbreviations: BAM – Beta-Attenuation Mass Monitor (Continuous monitor)

The preliminary findings from this analysis were presented at a stakeholders meeting on November 13, 2007, and were made available for public review during a comment period that ended November 30, 2007. During that time, no comments were received from the public. ADEQ presented and discussed this final demonstration at a stakeholder

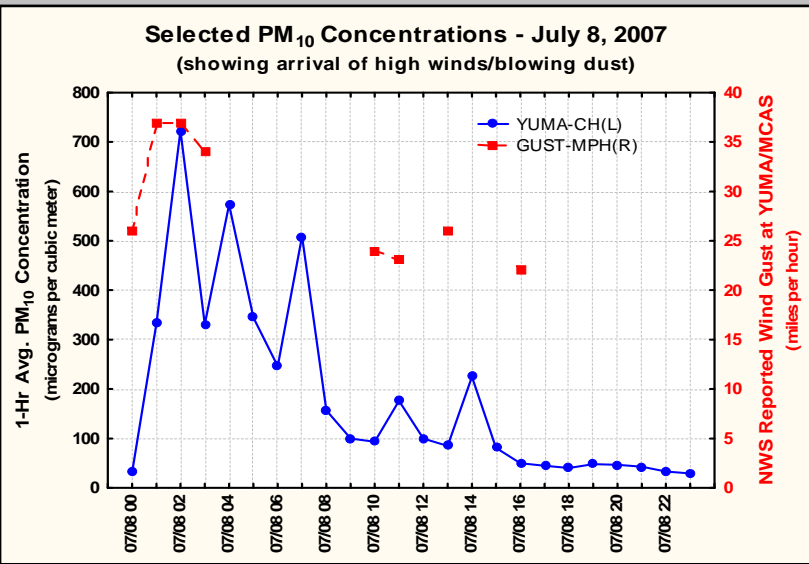
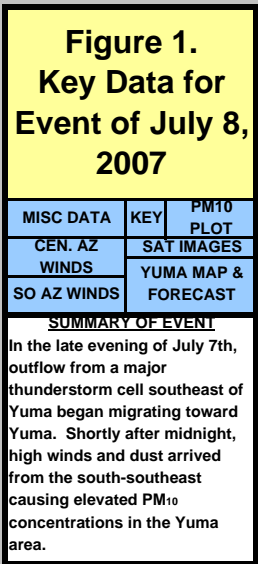
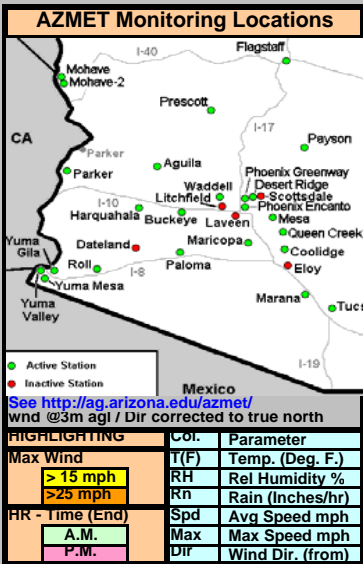
meeting on May 28, 2008. ADEQ has finalized this demonstration, which was made available for public comment from August 11, 2008 through September 10, 2008. Any comments that were received were forwarded to EPA with this demonstration pursuant to 40 CFR 51.14(c)(3)(i).

NORTHWEST PHOENIX							
	Hr	T(F)	RH	Rn	Spd	Max	Dir
10-Waddell	1	97	23	-	7	13	SW
	2	95	25	-	8	14	SW
	3	93	27	-	9	15	SW
	4	91	31	-	3	11	SW
	5	89	33	-	2	7	E
	6	85	41	-	1	3	N
	7	86	47	-	1	4	N
	8	90	37	-	2	6	E
	9	93	32	-	2	5	E
	10	95	28	-	3	11	S
	11	97	27	-	4	9	W
	12	99	25	-	4	9	W
	1	101	22	-	6	12	SW
	2	103	20	-	6	13	SW
	3	104	18	-	6	12	W
	4	105	17	-	6	11	W
	5	105	16	-	6	13	W
	6	105	16	-	6	13	W
	7	104	16	-	7	13	SW
	8	102	17	-	6	12	W
	9	100	19	-	7	15	W
	10	98	21	-	9	17	SW
	11	95	23	-	6	11	SW
	12	43	65	-	3	7	E

NORTH PHOENIX							
	Hr	T(F)	RH	Rn	Spd	Max	Dir
12-PHX Greenway	1	95	26	-	7	14	SW
	2	93	29	-	6	12	SW
	3	92	28	-	7	14	SW
	4	90	32	-	7	15	W
	5	89	35	-	7	13	SW
	6	87	37	-	3	10	W
	7	87	38	-	3	6	W
	8	89	37	-	5	10	SW
	9	91	33	-	7	13	W
	10	92	32	-	7	12	SW
	11	94	29	-	7	14	SW
	12	96	28	-	7	13	SW
	1	98	26	-	7	15	SW
	2	100	23	-	8	15	SW
	3	101	21	-	8	18	SW
	4	103	19	-	8	17	SW
	5	103	19	-	9	15	SW
	6	103	19	-	8	15	SW
	7	102	19	-	8	15	SW
	8	100	20	-	7	15	SW
	9	99	22	-	7	14	SW
	10	96	25	-	9	17	SW
	11	93	27	-	8	15	SW
	12	91	28	-	7	13	SW

NWS-Yuma MCAS							
	Hr	T(F)	VR	Dust	Spd	Gust	Dir
NWS-Yuma MCAS	1	87	10	-	18	26	S
	2	86	3	-	25	37	SE
	3	86	2	-	25	37	S
	4	86	5	-	22	22	S
	5	86	6	-	20	20	S
	6	84	8	-	8	8	S
	7	85	3	-	6	6	S
	8	88	8	-	11	11	SE
	9	90	10	-	10	10	SE
	10	92	10	-	10	10	S
	11	98	10	-	15	24	S
	12	102	10	-	18	23	S
	1	103	10	-	16	16	S
	2	103	9	-	18	26	S
	3	102	10	-	18	18	S
	4	103	10	-	14	14	S
	5	102	10	-	14	22	S
	6	101	10	-	16	16	S
	7	98	10	-	10	10	S
	8	95	10	-	9	9	S
	9	90	10	-	6	6	S
	10	89	10	-	9	9	SE
	11	86	10	-	9	9	S
	12	85	10	-	11	11	S

Event Contrib. Analysis							
Hourly PM <sub>10</sub> Conc. (µg/m <sup>3</sup> )							
MONITORS:				Hr	1		
1-YUMA-CH				1	32		
				2	333		
				3	723		
				4	331		
				5	573		
24-Hr. Avg PM <sub>10</sub>				6	345		
Monitor: with w/o				7	246		
1-YUMA-CH				8	509		
				9	157		
				10	100		
> NAAQS				11	93		
Pink=Event Contrib.				12	176		
Conclusion: As shown above, the PM <sub>10</sub> concentration would have been below the NAAQS "BUT FOR" the event contribution (hours highlighted in pink).				1	100		
				2	85		
				3	225		
				4	81		
				5	50		
				6	45		
				7	40		
				8	48		
				9	47		
				10	43		
				11	33		
				12	29		



PARKER							
	Hr	T(F)	RH	Rn	Spd	Max	Dir
08-Parker	1	83	48	-	7	10	S
	2	83	51	-	7	9	S
	3	84	47	-	9	16	S
	4	86	41	-	14	21	SW
	5	85	45	-	15	22	SW
	6	85	52	-	14	20	SW
	7	84	58	-	10	14	SW
	8	86	55	-	9	13	SW
	9	89	48	-	12	16	SW
	10	93	42	-	9	13	SW
	11	96	37	-	7	11	SW
	12	99	30	-	8	13	SW
	1	102	27	-	9	13	SW
	2	104	23	-	10	14	SW
	3	105	22	-	11	17	SW
	4	105	20	-	11	16	SW
	5	104	24	-	9	14	S
	6	101	29	-	10	14	S
	7	98	30	-	9	13	SW
	8	94	35	-	8	11	SW
	9	88	41	-	7	10	S
	10	88	35	-	9	12	S
	11	86	37	-	9	12	S
	12	85	41	-	10	15	S

MARICOPA							
	Hr	T(F)	RH	Rn	Spd	Max	Dir
06-Maricopa	1	94	30	-	6	16	SW
	2	90	36	-	12	19	SW
	3	88	41	-	12	19	SW
	4	87	44	-	6	9	SW
	5	88	41	-	4	7	W
	6	87	42	-	3	6	W
	7	89	40	-	4	7	N
	8	90	41	-	4	7	NE
	9	93	36	-	4	7	E
	10	95	32	-	3	7	S
	11	96	29	-	5	13	SW
	12	98	27	-	7	14	SW
	1	101	23	-	8	15	W
	2	102	20	-	8	15	NW
	3	104	18	-	9	16	W
	4	105	18	-	10	18	W
	5	105	18	-	11	17	W
	6	104	18	-	10	17	W
	7	102	18	-	9	14	W
	8	100	20	-	8	14	W
	9	98	24	-	9	15	W
	10	95	27	-	8	13	W
	11	91	30	-	7	11	W
	12	91	28	-	6	10	W

COOLIDGE							
	Hr	T(F)	RH	Rn	Spd	Max	Dir
05-Coolidge	1	89	37	-	10	24	SW
	2	88	38	-	14	23	SW
	3	85	45	-	7	13	SW
	4	83	50	-	5	7	S
	5	79	57	-	3	5	SE
	6	76	66	-	4	4	SE
	7	79	66	-	2	4	S
	8	83	60	-	4	8	S
	9	89	41	-	7	10	SW
	10	91	41	-	5	9	S
	11	93	37	-	7	13	S
	12	96	30	-	7	16	SW
	1	99	26	-	8	18	W
	2	101	22	-	9	16	W
	3	103	20	-	9	18	W
	4	104	18	-	11	17	W
	5	104	17	-	11	17	NW
	6	103	19	-	11	17	NW
	7	101	19	-	10	16	NW
	8	99	20	-	10	16	NW
	9	97	22	-	10	16	W
	10	95	26	-	10	19	W
	11	93	28	-	12	19	W
	12	86	39	-	4	8	S

## Assessment under the Technical Criteria Document (TCD)

1. Properly qualify and validate the air quality measurement to be flagged. As this was not a filter sampling date (1-in-6 run day), only data from the continuous analyzers were examined. The air quality monitoring data were reviewed by the agency responsible for operation of the monitor. All hourly PM<sub>10</sub> readings from the Yuma Courthouse were valid for July 8<sup>th</sup>. Audits of the analyzers revealed operations were within acceptable tolerance. No local sources were reported as significantly contributing to the air quality episode.

2. Review suspected contributing sources. The NWS and AzMET surface data from the Yuma area monitors provide a good explanation of the meteorological conditions that were in place on July 8<sup>th</sup>. As seen in figure 1, a large thunderstorm complex was located east and south of the Yuma area during the late evening hours of July 7<sup>th</sup>. Strong, southeasterly winds were generated as outflow from the thunderstorm complex. Clear air mode radar loops from the Yuma radar indicate east-southeasterly flow in northern Mexico with moderate echo returns being detected in northern Mexico heading towards the Yuma area. It is possible that the orange and red echo returns seen in the 1:00 a.m. and 2:00 a.m. radar imagery are indicating pockets of blowing dust caused by the outflow from the strong thunderstorm seen in the 10:00 p.m. GOES Satellite image in Figure 1. Reduced visibility in Yuma was coincident with strong winds created from thunderstorm outflow boundaries. After the outflow boundary had passed, light winds likely allowed transported dust to remain in the air over the Yuma area for an extended period of time until stronger winds returned due to daytime heating. The plot of hourly PM<sub>10</sub> concentration data in the upper right corner of Figure 1 confirms the identical timing of elevated PM<sub>10</sub> concentrations at Yuma Courthouse and strongest winds.

3. Examine all air quality monitoring information. Data from all monitors in the network were reviewed. Monitors from the affected areas are summarized in the table in the Background section of this assessment. Pursuant to 40 CFR 50.14(c)(3)(iii)(C), the "Historical Distribution" Table in Figure 1 has been included to demonstrate that the event is associated with a measured concentration in excess of normal historical fluctuations, including background (i.e., concentrations greater than the 95<sup>th</sup> percentile). Monitors with readings greater than that of the NAAQS on July 8<sup>th</sup>, 2007, which should be flagged, include Yuma Courthouse.

4. Examine the meteorological conditions before and during the event. The AzMET meteorological data are

summarized in Figure 1. The wind data are highlighted yellow if the max wind speed in the hour exceeds 15 mph and orange if it exceeds 25 mph. Strong wind gusts in Yuma began during the 12:00 a.m. hour of July 8<sup>th</sup> and continued through the 4:00-5:00 a.m. hours as an outflow boundary caused by a large thunderstorm complex approached and moved through the area. These high winds transported dust into the area, and caused reduced visibility and elevated PM<sub>10</sub> concentrations even after the winds began to die down. Reduced visibilities were also reported, though to a lesser extent, west of Yuma at NWS monitoring stations located in El Centro and Imperial, California approximately 3 hours after reduced visibility was first reported in Yuma (see attachments).

5. Perform a qualitative attribution to emission source(s). All evidence indicates the elevated PM<sub>10</sub> concentrations in the Yuma area can be attributed to soil emissions that were transported over a broad area into the Yuma area. No source-specific emission allocation is possible based on the data available for analysis. The hourly concentration data do not show any significant source other than the wind-blown dust event occurring on July 8<sup>th</sup>. Clear air mode radar in Yuma, used when no precipitation is occurring within close proximity to a radar site, picked up returns that are indicative of something other than clouds or precipitation moving towards the Yuma area. These radar images provide visual evidence of what is likely dust carried by the outflow from a thunderstorm being transported into the Yuma area.

6. Estimation of Contribution from Source or Event. The primary source appears to be wind-blown dust over northern Mexico and southwestern Arizona for which there is not an effective or efficient method to estimate the relative contributions from specific sources. The demonstration analysis contained in this report establishes the linkage between the measurements to be flagged and the event, thus satisfying the requirement in 40 CFR 50.14(c)(3)(iii)(B). Pursuant to 40 CFR 50.14(c)(3)(iii)(D), the "Event Contrib. Analysis" Table in Figure 1 has been included to demonstrate that there would have been no exceedance or violation but for the event (i.e., the contribution during the event overwhelmed the 24-hour average).

7. Determination that a Natural or Exceptional Event Contributed To an Exceedance. Based on this analysis, the event satisfies the requirement in 40 CFR 50.1(j) that the elevated concentrations at the Yuma Courthouse monitoring site were attributed to a natural event.

## Conclusion

Long-range transport of dust from soils. The elevated PM<sub>10</sub> event on July 8, 2007 in Yuma was the result of the transport of dust and soils from thunderstorm driven highwinds that suspended natural soils and soils from areas where Best Available Control Measures are in place and should be flagged for air quality planning purposes. The

"high wind" flag (A or RJ) should be applied to the monitor reading indicated in the table at the beginning of this report, as the monitor would have been below the NAAQS but for the contribution of the event.



**YUMA AND VICINITY  
 DUST CONTROL ACTION FORECAST  
 ISSUED FRIDAY, JULY 6, 2007  
[Three-day weather outlook:](#)**

**NOTE: During active summer monsoon episodes, outflows from even distant thunderstorms have the potential to cause periods of gusty winds and dense blowing dust.**

Not much change is expected weather-wise across Arizona the next few days as high pressure remains nearby. Moisture will continue to increase slightly through Saturday. This will moderate temperatures, meaning afternoon desert highs will be around 110°F rather than 115-118°F that we have seen this past week. Winds will generally be from the southwest. They could be a bit blustery near thunderstorms. The risk of wind-blown dust in Yuma will continue to be "Moderate" through Monday.

	<u>WINDS</u>	<u>WIND BLOWN DUST RISK</u>
Day #1: Sat 07/07/2007	Southwest winds 15-25 mph are expected much of the day.	<b>MODERATE</b>
Day #2: Sun 07/08/2007	South winds 10-20 mph are expected much of the day.	<b>MODERATE</b>
Day #3: Mon 07/09/2007	South winds 10-20 mph are likely much of the day.	<b>MODERATE</b>

**PM-10 & PM-2.5 (PARTICLES)**

**Description** – The term “particulate matter” (PM) includes both solid particles and liquid droplets found in air. Many manmade and natural sources emit PM directly or emit other pollutants that react in the atmosphere to form PM. Particles less than 10 micrometers in diameter tend to pose the greatest health concern because they can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 micrometers in diameter are referred to as “fine” particles and are responsible for many visibility degradations (brown cloud). Particles with diameters between 2.5 and 10 micrometers are referred to as “coarse”.

**Sources** – Fine = All types of combustion (motor vehicles, power plants, wood burning, etc.) and some industrial processes. Coarse = crushing or grinding operations and dust from paved or unpaved roads.

**Potential health impacts** – PM can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases, such as asthma and chronic bronchitis.

**Units of measurement** – Micrograms per cubic meter (ug/m3)

**Averaging interval** – 24 hours (midnight to midnight).

**Reduction tips** – Stabilize loose soils, minimize travel on dirt roads, utilize tarps on haul trucks, limit use of leaf-blowers, and on high-wind days reduce outdoor activities.

CKR 05/09/2005



U.S. Department of Commerce  
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL  
CLIMATOLOGICAL DATA**  
(may be updated)  
**HOURLY OBSERVATIONS TABLE**  
**YUMA MCAS (03145)**  
**YUMA , AZ**  
**(07/2007)**

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801

Elevation: 213 ft. above sea level

Latitude: 32.650

Longitude: -114.617

Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti- meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0051	5	CLR	10.00		87	30.6	73	23.0	67	19.4	52	18	160	26	29.51			29.72	AA		29.74
08	0149	5	FEW001	3.00		86	30.0	74	23.2	68	20.0	55	29	150	37	29.53			M	SP		29.76
08	0151	5	FEW001	3.00		86	30.0	74	23.2	68	20.0	55	25	150	37	29.53	3	013	29.75	AA		29.76
08	0246	5	BKN001	2.00		86	30.0	74	23.2	68	20.0	55	25	160	37	29.54			M	SP		29.77
08	0247	5	BKN001	2.00		86	30.0	74	23.2	68	20.0	55	24	160	36	29.54			29.75	AA		29.77
08	0251	5	SCT001	3.00		86	30.0	75	23.8	70	21.0	59	26	160	34	29.54			M	SP		29.77
08	0351	5	CLR	5.00		86	30.0	74	23.5	69	20.6	57	22	170		29.54			29.75	AA		29.77
08	0451	5	CLR	6.00		86	30.0	74	23.2	68	20.0	55	20	160		29.55	3	005	29.76	AA		29.78
08	0551	5	CLR	8.00		84	28.9	73	22.8	68	20.0	59	8	160		29.56			29.77	AA		29.79
08	0651	5	CLR	3.00		85	29.4	73	22.7	67	19.4	55	6	160		29.57			29.78	AA		29.80
08	0751	5	CLR	8.00		88	31.1	74	23.2	67	19.4	50	11	150		29.57	1	008	29.79	AA		29.80
08	0851	5	CLR	10.00		90	32.2	74	23.2	66	18.9	45	10	150		29.58			29.80	AA		29.81
08	0951	5	FEW150 SCT200	10.00		92	33.3	73	22.9	64	17.8	40	10	160		29.58			29.79	AA		29.81
08	1051	5	FEW150 SCT200	10.00		98	36.7	74	23.2	62	16.7	31	15	160	24	29.58	0	000	29.79	AA		29.81
08	1151	5	SCT250	10.00		102	38.9	73	22.7	58	14.4	23	18	190	23	29.57			29.78	AA		29.80
08	1251	5	SCT250	10.00		103	39.4	73	22.9	58	14.4	23	16	170		29.55			29.77	AA		29.78
08	1351	5	SCT250	9.00		103	39.4	73	22.9	58	14.4	23	18	160	26	29.54	8	013	29.75	AA		29.77
08	1451	5	SCT250	10.00		102	38.9	71	21.8	54	12.2	20	18	170		29.52			29.73	AA		29.75
08	1551	5	SCT250	10.00		103	39.4	72	21.9	54	12.2	20	14	170		29.50			29.71	AA		29.73
08	1651	5	SCT250	10.00		102	38.9	70	21.3	52	11.1	19	14	190	22	29.48	8	018	29.70	AA		29.71
08	1751	5	SCT250	10.00		101	38.3	72	22.3	57	13.9	23	16	160		29.47			29.68	AA		29.70
08	1851	5	CLR	10.00		98	36.7	71	21.9	57	13.9	26	10	180		29.47			29.68	AA		29.70
08	1951	5	CLR	10.00		95	35.0	71	21.4	57	13.9	28	9	180		29.48	5	003	29.69	AA		29.71
08	2051	5	CLR	10.00		90	32.2	72	22.2	63	17.2	41	6	170		29.49			29.70	AA		29.72
08	2151	5	CLR	10.00		89	31.7	71	21.5	61	16.1	39	9	150		29.51			29.72	AA		29.74
08	2251	5	CLR	10.00		86	30.0	71	21.9	64	17.8	48	9	160		29.51	1	013	29.72	AA		29.74
08	2351	5	CLR	10.00		85	29.4	72	22.4	66	18.9	53	11	160		29.52			29.73	AA		29.75

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U.S. Department of Commerce  
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL  
CLIMATOLOGICAL DATA**  
(may be updated)  
**HOURLY OBSERVATIONS TABLE**  
**NAF (23199)**  
**EL CENTRO , CA**  
**(07/2007)**

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801

Elevation: -43 ft. below sea level

Latitude: 32.817

Longitude: -115.667

Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti- meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0056	5	CLR	10.00		82	27.8	73	22.9	69	20.6	65	5	110		29.75	1	009	29.75	AA		29.71
08	0156	5	CLR	10.00		83	28.3	74	23.4	70	21.1	65	13	130		29.77			29.77	AA		29.73
08	0256	5	CLR	10.00		84	28.9	75	23.9	71	21.7	65	17	140		29.78			29.78	AA		29.74
08	0356	5	CLR	10.00		81	27.2	74	23.4	71	21.7	72	10	140		29.78	1	011	29.78	AA		29.74
08	0456	5	CLR	9.00		81	27.2	74	23.0	70	21.1	69	3	170		29.79			29.80	AA		29.75
08	0556	5	CLR	7.00		84	28.9	74	23.2	69	20.6	61	6	030		29.82			29.82	AA		29.78
08	0656	5	CLR	9.00		86	30.0	75	23.9	70	21.1	59	3	040		29.82	1	013	29.82	AA		29.78
08	0756	5	CLR	10.00		90	32.2	76	24.5	70	21.1	52	6	350		29.83			29.83	AA		29.79
08	0856	5	CLR	10.00		92	33.3	77	24.8	70	21.1	49	3	040		29.83			29.83	AA		29.79
08	0956	5	CLR	10.00		96	35.6	77	25.0	69	20.6	42	8	030		29.82	0	000	29.82	AA		29.78
08	1056	5	CLR	10.00		98	36.7	77	25.0	68	20.0	38	6	100		29.81			29.82	AA		29.77
08	1156	5	SCT200	10.00		100	37.8	75	24.1	64	17.8	31	6	160		29.79			29.80	AA		29.75
08	1256	5	SCT200	10.00		103	39.4	76	24.5	64	17.8	28	8	150		29.77	8	018	29.77	AA		29.73
08	1356	5	SCT200	10.00		105	40.6	74	23.4	59	15.0	22	5	130		29.74			29.75	AA		29.70
08	1456	5	FEW200	10.00		107	41.7	74	23.5	58	14.4	20	8	150		29.72			29.72	AA		29.68
08	1556	5	FEW200	10.00		105	40.6	75	23.7	60	15.6	23	20	120		29.70	6	023	29.70	AA		29.66
08	1656	5	CLR	10.00		102	38.9	75	23.8	62	16.7	27	15	110		29.69			29.69	AA		29.65
08	1756	5	CLR	10.00		97	36.1	75	23.6	64	17.8	34	13	140		29.69			29.69	AA		29.65
08	1856	5	CLR	10.00		93	33.9	71	21.6	59	15.0	32	10	140		29.70	5	000	29.70	AA		29.66
08	1956	5	CLR	10.00		89	31.7	71	21.8	62	16.7	41	9	130		29.71			29.72	AA		29.67
08	2056	5	CLR	10.00		87	30.6	71	21.8	63	17.2	45	7	120		29.73			29.74	AA		29.69
08	2156	5	CLR	10.00		85	29.4	71	21.7	64	17.8	49	8	150		29.74	1	015	29.75	AA		29.70
08	2256	5	CLR	10.00		84	28.9	72	22.2	66	18.9	55	5	150		29.75			29.75	AA		29.71
08	2356	5	CLR	10.00		83	28.3	73	22.7	68	20.0	61	0	000		29.76			29.76	AA		29.72

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U.S. Department of Commerce  
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL  
CLIMATOLOGICAL DATA  
(final)  
HOURLY OBSERVATIONS TABLE  
IMPERIAL COUNTY AIRPORT (03144)  
IMPERIAL , CA  
(07/2007)**

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801

Elevation: -59 ft. below sea level

Latitude: 32.834

Longitude: -115.579

Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti- meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
08	0053	12	CLR	10.00		85	29.4	74	23.4	69	20.6	59	9	120		29.77	1	008	29.71	AA		29.71
08	0153	12	CLR	10.00		84	28.9	74	23.2	69	20.6	61	16	130		29.79			29.73	AA		29.73
08	0253	12	CLR	10.00		84	28.9	74	23.5	70	21.1	63	16	140	22	29.80			29.74	AA		29.74
08	0353	12	CLR	10.00		86	30.0	74	23.5	69	20.6	57	15	160		29.80	1	012	29.75	AA		29.74
08	0453	12	CLR	9.00		85	29.4	74	23.4	69	20.6	59	11	140		29.81			29.75	AA		29.75
08	0553	12	CLR	10.00		84	28.9	74	23.2	69	20.6	61	6	040		29.83			29.77	AA		29.77
08	0653	12	CLR	10.00		86	30.0	75	23.9	70	21.1	59	3	070		29.84	2	012	29.78	AA		29.78
08	0753	12	CLR	10.00		88	31.1	76	24.2	70	21.1	55	3	070		29.85			29.79	AA		29.79
08	0853	12	CLR	10.00		92	33.3	76	24.4	69	20.6	47	5	VR		29.85			29.79	AA		29.79
08	0953	12	CLR	10.00		96	35.6	77	24.7	68	20.0	40	0	000		29.84	0	000	29.78	AA		29.78
08	1053	12	CLR	10.00		97	36.1	77	24.8	68	20.0	39	5	VR		29.83			29.77	AA		29.77
08	1153	12	CLR	10.00		102	38.9	76	24.4	64	17.8	29	6	VR		29.81			29.75	AA		29.75
08	1253	12	CLR	10.00		104	40.0	75	23.8	61	16.1	24	7	VR		29.79	8	019	29.72	AA		29.73
08	1353	12	CLR	10.00		107	41.7	73	22.8	55	12.8	18	0	000		29.76			29.70	AA		29.70
08	1453	12	CLR	10.00		108	42.2	76	24.1	60	15.6	21	14	100		29.73			29.67	AA		29.67
08	1553	12	CLR	10.00		104	40.0	74	23.6	60	15.6	24	22	120		29.73	6	020	29.67	AA		29.67
08	1653	12	CLR	10.00		102	38.9	74	23.0	59	15.0	24	18	130		29.71			29.65	AA		29.65
08	1753	12	CLR	10.00		98	36.7	74	23.5	63	17.2	32	17	120		29.71			29.65	AA		29.65
08	1853	12	CLR	10.00		95	35.0	72	21.9	59	15.0	30	11	140		29.72	5	002	29.66	AA		29.66
08	1953	12	CLR	10.00		92	33.3	71	21.5	59	15.0	33	10	140		29.74			29.68	AA		29.68
08	2053	12	CLR	10.00		89	31.7	71	21.8	62	16.7	41	11	120		29.75			29.69	AA		29.69
08	2153	12	CLR	10.00		87	30.6	72	22.1	64	17.8	46	13	130		29.76	1	015	29.70	AA		29.70
08	2253	12	CLR	10.00		86	30.0	73	22.9	67	19.4	53	9	140		29.77			29.71	AA		29.71
08	2353	12	CLR	10.00		84	28.9	73	22.9	68	20.0	59	8	120		29.78			29.72	AA		29.72

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